CLAIMS

What is claimed is:

1   1.   A system having a processor, memory operative with said processor, and storage media

2   operative with said processor, said system further comprising:

3   a business framework;

4   a database framework operative with said business framework; and

5   a client framework operative with said business framework;

6   wherein said business framework, said database framework, and said client framework

7   form an enterprise system framework.

1   2.   The system of claim 1, wherein said enterprise system framework includes one or more

2   rapid development services.

1   3.   The system of claim 2, wherein said rapid development services include one or more

2   developer services.

1   4.   The system of claim 3, wherein said developer services allow one or more developers to

2   execute said enterprise system framework from a local computer system without configuring

3   said enterprise system framework.

1   5.   The system of claim 3, wherein said developer services allow one or more developers to

2   execute said enterprise system framework without security.

1 6.   The system of claim 3, wherein said developer services allow one or more developers to

2 debug one or more stored procedures.

1 7.   The system of claim 1, wherein said business framework provides rapid development

2 services to develop said business framework.

1 8.   The system of claim 7, wherein said rapid development services generate a business

2 framework abstraction of said business framework.

1 9.   The system of claim 8, wherein said business framework abstraction allows said

2 business framework to modify one or more business framework services that said business

3 framework provides to one or more business objects.

1 10.   The system of claim 8, wherein said business framework abstraction allows said

2 business framework to modify a business framework methodology.

1 11.   The system of claim 7, wherein a set of central services on one or more business objects

2 includes administrative services.

1 12.   The system of claim 11, wherein said administrative services allow said business

2 framework to track system usage.

1 13.   The system of claim 1, wherein said business framework provides a set of central

2 services for one or more business objects.

1   14.   The system of claim 13, wherein said set of central services on business objects

2   includes transaction services.

1   15.   The system of claim 14, wherein said transaction services are provided by a COM+

2   transaction server.

1   16.   The system of claim 14, wherein said transaction services are provided by said business

2   framework.

1   17.   The system of claim 13, wherein said central services on said one or more business

2   objects include security services to control user access to said one or more business objects.

1   18.   The system of claim 13, wherein said central services on said one or more business

2   objects include security services to control user access to one or more external objects.

1   19.   The system of claim 13, wherein said central services on said one or more business

2   objects include security services to control user access to one or more database objects.

1   20.   The system of claim 13, wherein said central services on said one or more business

2   objects include security services to control user access to one or more client objects.

1   21.   The system of claim 17, wherein said security services utilize one or more services

2   provided by an external service provider.

1   22.   The system of claim 17, wherein said security services are abstracted from an external

2   service provider's implementation.

1   23.   The system of claim 17, wherein said security services include automatic generation of

2   special components that form walls around said one or more business objects to control access

3   to said one or more business objects.

1   24.   The system of claim 13, wherein said set of central services on said one or more

2   business objects includes organizational services.

1   25.   The system of claim 24, wherein said organizational services include a compulsory

2   belonging of business objects to groups.

1   26.   The system of claim 25, wherein said groups include one or more business groups.

1   27.   The system of claim 25, wherein one or more special groups includes groups identifying

2   business objects as belonging to said client framework.

1   28.   The system of claim 24, wherein said organizational services include compulsory

2   naming conventions for said one or more business objects.

1   29.   The system of claim 13, wherein said set of central services on business objects

2   includes protocol services.

1   30.   The system of claim 29, wherein said protocol services enable a protocol to be

2   abstracted from communication between said one or more business objects and said client

3   framework.

1   31.   The system of claim 29, wherein said protocol services enable a protocol to be

2   abstracted from communication between said one or more business objects and an external

3   framework.

1   32.   The system of claim 29, wherein said protocol services enable a protocol to be

2   abstracted from communication between said one or more business objects and a database

3   framework.

1   33.   The system of claim 29, wherein said protocol services enable a protocol to be

2   abstracted from communication between said one or more business objects and one or more

3   client objects.

1   34.   The system of claim 29, wherein said protocol services enable different business objects

2   to use different protocols.

1   35.   The system of claim 34, wherein said one or more business objects uses a protocol

2   based on a special group to which they belong.

1   36.   The system of claim 13, wherein said one or more business objects are distributed on

2   more than one server.

1   37.   The system of claim 13, wherein said one or more business objects are distributed on

2   more then one client.

1   38.   The system of claim 13, wherein said one or more business objects are distributed on

2   more then one database.

1   39.   The system of claim 13, wherein said one or more business objects are distributed on

2   more then one external object.

1   40.   The system of claim 13, wherein said set of central services includes adapter services.

1   41.   The system of claim 40, wherein said adapter services allow said one or more business

2   objects to invoke other computer systems.

1   42.   The system of claim 41, wherein said computer systems include computer systems

2   implementing said database framework.

1   43.   The system of claim 42, wherein an adapter that communicates with said database

2   framework allows said one or more business objects to be fetched from a database and placed

3   in one of said business objects in one operation.

1   44.   The system of claim 42, wherein an adapter that communicates with said database

2   framework allows said one or more business objects to be fetched from a data repository and

3   placed in one of said business objects in one operation.

1   45.   The system of claim 41, wherein said computer systems include computer systems

2   implementing an external framework.

1   46.   The system of claim 40, wherein said adapter services allow business objects to be

2   abstracted from an adapter used by one or more of said business objects.

1   47.   The system of claim 46, wherein said adapter that said business object uses is

2   determined by one or more special groups to which said business object belongs.

1   48.   The system of claim 40, wherein said adapter services allow one or more adapters to

2   communicate with computer systems in a protocol supported by said computer systems.

1   49.   The system of claim 13, wherein said set of central services on said business objects

2   includes error-handling services.

1   50.   The system of claim 49, wherein said error-handling services support a capture of one

2   or more operating system exceptions.

1   51.   The system of claim 49, wherein said error-handling services support a capture of one

2   or more COM errors.

1   52.   The system of claim 49, wherein said error-handling services include logging errors in

2   an event viewer when errors are captured.

1   53.   The system of claim 49, wherein said error-handling services include logging errors in

2   an event viewer when errors are detected.

1   54.   The system of claim 49, wherein said error-handling services include generating at least

2   one call stack.

1   55.   The system of claim 13, wherein said set of central services includes layering services.

1   56.   The system of claim 55, wherein said layering services include a client framework

2   layer.

1   57.   The system of claim 55, wherein said layering services include an external framework

2   layer.

1   58.   The system of claim 55, wherein said layering services include a reporting system layer.

1   59.   The system of claim 55, wherein said layering services include a client framework

2   layer, an external framework layer, and a reporting system layer.

1   60.   The system of claim 59, wherein said client framework layer enables said client

2   framework and said business framework in an optimized manner.

1   61.   The system of claim 60, wherein said optimized manner includes having said client

2   framework and said business framework interact with a minimum of round-trips.

1   62.   The system of claim 60, wherein said optimized manner includes having said client

2   framework and said business framework interact in an abstracted fashion.

1   63.   The system of claim 59, wherein said reporting system layer enables a reporting system

2   and said business framework to operate in an abstracted fashion.

1   64.   The system of claim 13, wherein said set of central services on business objects

2   includes life-cycle services.

1 65. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects after said business objects are created.

1 66. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects after said business objects are updated.

1 67. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects after said business objects are deleted.

1 68. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects after said business objects are fetched.

1 69. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects before said business objects are updated.

1 70. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects before said business objects are deleted.

1 71. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects before said business objects are fetched.

1 72. The system of claim 13, wherein said set of central services includes rapid development

2 services.

1 73. The system of claim 72, wherein said rapid development services allow said one or

2 more business objects that are not tied to a database to be generated automatically.

1 74. The system of claim 73, wherein said one or more business objects consist of a layer of

2 non-generated code and a layer of generated-if-not-existing code.

1 75. The system of claim 72, wherein said services allow said one or more business objects

2 that are tied to a database table to be generated automatically.

1 76. The system of claim 75, wherein said one or more business objects consist of a layer of

2 non-generated code, a layer of generated code, and a layer of generated-if-not-existing code.

1 77. The system of claim 76, wherein said layer of non-generated code provides generic

2 services for said business object.

1 78. The system of claim 77, wherein said generic services allow business objects to make

2 copies of themselves automatically.

1 79. The system of claim 76, wherein said layer of non-generated code guarantees that said

2 layer of generated code implements one or more certain services.

1 80. The system of claim 76, wherein said layer of non-generated code contains services to

2 assist said layer of generated code.

1 81. The system of claim 76, wherein said layer of generated code and said layer of

2 generated-if-not-existing code are created by a third-party tool.

1 82. The system of claim 76, wherein said layer of generated code is overwritten by a

2 developer.

1   83.   The system of claim 76, wherein said layer of generated-if-not-existing code is

2   overwritten by a developer.

1   84.   The system of claim 75, wherein said business objects include state objects, collections

2   of state objects, and stateless business objects.

1   85.   The system of claim 84, wherein said state objects can encapsulate one row of a

2   database table such that encapsulation is done within said layer of generated code for said state

3   object.

1   86.   The system of claim 85, wherein said layer of generated code can automatically contain

2   one or more get member functions where said member functions match a database schema.

1   87.   The system of claim 85, wherein said layer of generated code can automatically contain

2   one or more put member functions where said member functions match a database schema.

1   88.   The system of claim 86, wherein if said layer of generated code contains said get and

2   put member functions, then there exists compile-time checking between said business object

3   and a database schema.

1   89.   The system of claim 85, wherein said layer of generated code can automatically contain

2   one or more member variables where said one more member variables matches a database

3   schema.

1   90.   The system of claim 89, wherein said member variables are objects when a

2   corresponding database type is a calendar.

1   91.   The system of claim 85, wherein said layer of generated code can contain status flags.

1   92.   The system of claim 84, wherein said collection of state objects encapsulate zero or

2   more state objects.

1   93.   The system of claim 92, wherein said state collection object is compile-time bound to a

2   corresponding state object.

1   94.   The system of claim 92, wherein said collection of state objects is implemented using a

2   container algorithm.

1   95.   The system of claim 94, wherein said container algorithm is abstracted into a separate

2   object.

1   96.   The system of claim 84, wherein said stateless business object can include methods for

2   communicating with stored procedures associated with a database table associated with a

3   business object.

1   97.   The system of claim 84, wherein said stateless business objects are compile-time bound

2   to corresponding state objects and to collection of state objects.

1   98.   The system of claim 72, wherein said services allow run-time binding of business

2   objects.

1   99.   The system of claim 72, wherein said rapid development services allow business objects

2   to inherit from each other.

1   100.   The system of claim 72, wherein said rapid development services allow business objects

2   to convert automatically from one business object to another.

1   101.   The system of claim 72, wherein said rapid development services enable automatic

2   replay of deadlock database errors when detected.

1   102.   The system of claim 72, wherein said services enable business objects to keep copies,

2   optionally and automatically, of their old state.

1   103.   The system of claim 13, wherein said set of central services on business objects

2   includes messaging services.

1   104.   The system of claim 103, wherein said messaging services allow business objects to

2   send messages to other users.

1   105.   The system of claim 103, wherein said messaging services include message queue

2   services.

1   106.   The system of claim 105, wherein said message queue services enable asynchronous

2   method invocation between business objects.

1   107.   The system of claim 105, wherein said message queue services enable one or more

2   business objects to be invoked immediately.

1   108.   The system of claim 105, wherein said message queue services enable one or more

2   business objects to be invoked in the event of a failure.

1 109. The system of claim 105, wherein said message queue services are available even when

2 an application is not configured in a transaction server.

1 110. The system of claim 13, wherein said set of central services for said business objects

2 include asynchronous services.

1 111. The system of claim 110, wherein said asynchronous services include an ability for

2 business objects to invoke each other in an asynchronous manner.

1 112. The system of claim 110, wherein said asynchronous services do not preclude the

2 ability for one or more business objects to invoke each other in a synchronous manner.

1 113. The system of claim 110, wherein said asynchronous services are available if an

2 application is not configured in a transaction server.

1 114. The system of claim 110, wherein said asynchronous services are optimized for high-

2 performance communication.

1 115. The system of claim 13, wherein said set of central services for said business objects

2 includes scheduling services.

1 116. The system of claim 115, wherein said scheduling services allow business objects to be

2 invoked once at a given date and time.

1 117. The system of claim 13, wherein set of central services on business objects includes

2 reporting services.

1   118.   The system of claim 117, wherein said reporting services allow integration with an

2   external report application.

1   119.   The system of claim 117, wherein said reporting services provide rapid development for

2   reports.

1   120.   The system of claim 119, wherein said reporting services include an external report

2   application having binding functions in state objects.

1   121.   The system of claim 1, wherein said database framework consists of one or more stored

2   procedures, one or more user-defined types, one or more tables, and one or more views in a

3   relational database.

1   122.   The system of claim 121, wherein all access to said database framework is through said

2   stored procedures.

1   123.   The system of claim 121, wherein said stored procedures, said user-defined types,

2   tables, and views all follow one or more naming conventions.

1   124.   The system of claim 123, wherein said naming conventions allow a third-party tool to

2   identify all insert stored procedures, all update stored procedures, all delete stored procedures,

3   and all query stored procedures that correspond to each table and to each view in said database.

1   125.   The system of claim 124, wherein said identification allows a third-party tool to

2   generate automatically all insert stored procedures, update stored procedures, and all delete

3   stored procedures that correspond to all tables and views.

1   126.   The system of claim 125, wherein said generation allows said stored procedures to

2   support simultaneous access by multiple users.

1   127.   The system of claim 125, wherein said generation allows stored procedures to support

2   keeping history automatically.

1   128.   The system of claim 125, wherein said generation allows said stored procedures to

2   support more services rapidly.

1   129.   The system of claim 121, wherein said user-defined types enables one or more database

2   columns to identify themselves as components within a unit system.

1   130.   The system of claim 1, wherein said client framework provides rapid development

2   services for said client framework.

1   131.   The system of claim 130, wherein said rapid development services enable said client

2   framework to change one or more central services for one or more client forms and one or more

3   client dialogs en masse.

1   132.   The system of claim 1, wherein said client framework provides a set of central services

2   for client forms, client dialogs, and HTML pages.

1   133.   The system of claim 132, wherein said set of central services includes abstraction

2   services to abstract client forms and client dialogs from a web browser that hosts said client

3   forms and said client dialogs.

1 134. The system of claim 132, wherein said set of central services includes providing life-

2 cycle services.

1 135. The system of claim 134, wherein said life-cycle services include notifying said client

2 forms and said client dialogs to initialize said client forms and said client dialogs and further

3 notifying said client forms and said client dialogs when a command is invoked.

1 136. The system of claim 134, wherein said life-cycle services include notifying one or more

2 of said client forms to initialize said one or more client forms and further notifying said one or

3 more client forms when a command is invoked.

1 137. The system of claim 136 wherein said command is a get command.

1 138. The system of claim 136 wherein said command is a save command.

1 139. The system of claim 136 wherein said command is a refresh command.

1 140. The system of claim 136 wherein said command is a delete command.

1 141. The system of claim 134, wherein said life-cycle services include notifying one or more

2 of said client dialogs to initialize said one or more client dialogs and further notifying said one

3 or more client dialogs when a command is invoked.

1 142. The system of claim 141, wherein said command is a get command.

1 143. The system of claim 141, wherein said command is a save command.

1   144.   The system of claim 141, wherein said command is a refresh command.

1   145.   The system of claim 141, wherein said command is a delete command.

1   146.   The system of claim 134, wherein said life-cycle services allows said client forms and

2   said client dialogs to override default behavior by not passing said life-cycle messages to said

3   client framework.

1   147.   The system of claim 132, wherein said set of central services include performance

2   services.

1   148.   The system of claim 147, wherein said performance services include caching services.

1   149.   The system of claim 148, wherein said caching services include routing all outbound

2   calls through a cache so that an outbound call need not be made if one or more results are

3   already in said cache.

1   150.   The system of claim 148, wherein said cache is written in C++.

1   151.   The system of claim 147, wherein said performance services include asynchronous

2   services.

1   152.   The system of claim 151, wherein said asynchronous services include services which

2   enable one or more client objects to invoke one or more server objects in an asynchronous

3   manner.

1 153.   The system of claim 151, wherein said asynchronous services include asynchronous

2 downloading services.

1 154.   The system of claim 153, wherein said asynchronous downloading services enable the

2 downloading of said client forms and other objects as a background process.

1 155.   The system of claim 147, wherein said performance services include making said client

2 forms, said client dialogs and said client framework light-weight.

1 156.   The system of claim 147, wherein said performance services include using said business

2 objects natively.

1 157.   The system of claim 132, wherein said central services include persistence services.

1 158.   The system of claim 157, wherein said persistence services allow HTML page state to

2 be preserved.

1 159.   The system of claim 132, wherein said set of central services includes rapid

2 development services.

1 160.   The system of claim 159, wherein said rapid development services include automatic

2 updating of a status flag of said one or more business objects.

1 161.   The system of claim 159, wherein said rapid development services include property

2 services.

1 162. The system of claim 161, wherein said property services enable one or more controls on

2 HTML pages to exhibit behavior based on properties defined for said control.

1 163. The system of claim 162, wherein said exhibited behavior allows said client forms and

2 said client dialogs to invoke business objects without coding.

1 164. The system of claim 162, wherein said exhibited behavior includes loading one or more

2 controls from specific business object data, taking action on a control selection, taking action

3 when a get, a save, a delete, a refresh, and a history command is invoked.

1 165. The system of claim 159, wherein said rapid development services, said client forms

2 and said client dialogs are written in Visual Basic.

1 166. The system of claim 159, wherein said rapid development services include integration

2 with a deployment apparatus.

1 167. The system of claim 166, wherein said integration allows a deployment apparatus to

2 discover all binaries needing to be installed on a client machine.

1 168. The system of claim 1, wherein an external framework operates within an enterprise

2 application interface.

1 169. The system of claim 1, wherein an external framework provides a set of central

2 services.

1 170. The system of claim 169, wherein said set of central services includes protocol services.

1 171. The system of claim 170, wherein said protocol services include a protocol framework

2 for incorporating new protocols into said system.

1 172. The system of claim 169, wherein said set of central services includes communication

2 services.

1 173. The system of claim 172, wherein said communication services include synchronous

2 invocation services.

1 174. The system of claim 173, wherein said synchronous invocation services allow

2 synchronous method invocation between objects within said external framework and one or

3 more external clients.

1 175. The system of claim 172, wherein said communication services include publish

2 invocation services.

1 176. The system of claim 172, wherein said communication services include subscribe

2 invocation services.

1 177. The system of claim 175, wherein said publish invocation services allow external

2 framework objects to publish events asynchronously.

1 178. The system of claim 175, wherein said subscribe invocation services allow external

2 framework objects to publish events asynchronously.

1 179. The system of claim 169, wherein said central services include abstraction services.

1   180.   The system of claim 179, wherein said abstraction services allow one or more external

2   clients to be abstracted from said external framework.

1   181.   The system of claim 179, wherein said abstraction services allow said business

2   framework to be abstracted from said external framework.

1   182.   The system of claim 169, wherein said set of central services includes rapid

2   development services.

1   183.   The system of claim 182, wherein said rapid development services include automatic

2   run-time validation between one or more external clients and said external framework.

1   184.   The system of claim 182, wherein said rapid development services include automatic

2   run-time validation between said external framework and said business framework.

1   185.   The system of claim 3, wherein said developer services allow developers to debug said

2   enterprise system framework with security.

1   186.   The system of claim 3, wherein said developer service allows a developer to debug said

2   enterprise system framework from a local computer system without having to configure said

3   enterprise system framework in COM+, a web server, or any other third-party server software.

1   187.   The system of claim 3, wherein said developer service allows a developer to debug said

2   enterprise system framework without security.

1   188.   The system of claim 7, wherein said rapid development services generate a business

2   framework abstraction of said business framework from one or more business objects.

1   189.   The system of claim 7, wherein said rapid development services generate a business

2   framework abstraction of said business framework from one or more business objects through a

3   layer of generated code.

1   190.   The system of claim 8, wherein said business framework abstraction allows said

2   business framework to modify a business framework methodology without affecting one or

3   more business objects.

1   191.   The system of claim 11, wherein said administrative services allow said business

2   framework to track one or more users of said system.

1   192.   The system of claim 11, wherein said administrative services allow said business

2   framework to garner performance metrics.

1   193.   The system of claim 25, wherein said groups include one or more special groups.

1   194.   The system of claim 193, wherein said special groups include groups identifying

2   business objects as belonging to an external framework.

1   195.   The system of claim 193, wherein said special groups include groups identifying

2   business objects as belonging to a reporting system.

1   196.   The system of claim 13, wherein said one or more business objects is distributed on

2   more than one server with performance being optimized for such distribution.

1   197.   The system of claim 40, wherein said adapter services allow one or more adapters to

2   communicate with computer systems in a data access technology supported by said computer

3   systems.

1   198.   The system of claim 49, wherein said error-handling services include generating at least

2   one call stack that includes line numbers.

1   199.   The system of claim 49, wherein said error-handling services include generating at least

2   one call stack that includes line numbers when errors are captured.

1   200.   The system of claim 55, wherein said layering services include a client framework

2   layer.

1   201.   The system of claim 55, wherein said layering services include an external framework

2   layer.

1   202.   The system of claim 55, wherein said layering services include a reporting system layer.

1   203.   The system of claim 59, wherein said client framework layer enables said client

2   framework and said business framework to interact in an abstracted fashion.

1   204.   The system of claim 59, wherein said external framework layer enables an external

2   framework and said business framework to interact in an abstracted fashion.

1 205. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects before and after said business objects are created.

1 206. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects before and after said business objects are updated.

1 207. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects before and after said business objects are deleted.

1 208. The system of claim 64, wherein said life-cycle services include notifying said one or

2 more business objects before and after said business objects are fetched.

1 209. The system of claim 72, wherein said rapid development services allow said one or

2 more business objects to be generated automatically.

1 210. The system of claim 72, wherein said services allow said one or more business objects

2 that are tied to a database view to be generated automatically.

1 211. The system of claim 76, wherein said layer of generated code is overwritten constantly.

1 212. The system of claim 75, wherein said business objects include state objects.

1 213. The system of claim 75, wherein said business objects include collections of state

2 objects.

1 214. The system of claim 75, wherein said business objects include stateless business

2 objects.

1 215. The system of claim 84, wherein said state objects can encapsulate one row of a

2 database view such that encapsulation is done within said layer of generated code for said state

3 object.

1 216. The system of claim 85, wherein said layer of generated code can automatically contain

2 get and put member functions where they match a database schema.

1 217. The system of claim 86, wherein if said layer of generated code contains said get and

2 put member functions, then there exists compile-time checking between said business object

3 and said database schema.

1 218. The system of claim 85, wherein said layer of generated code can automatically contain

2 one or more member variables where said one or more member variables match a database

3 schema.

1 219. The system of claim 89, wherein said member variables are objects where a

2 corresponding database type is a member of the group consisting of calendar, unit, primary key,

3 and binary file.

1 220. The system of claim 85, wherein said layer of generated code can contain status flags.

1 221. The system of claim 89, wherein said member variables are objects when a

2 corresponding database type is a unit.

1   222.   The system of claim 89, wherein said member variables are objects when a

2   corresponding database type is a primary key.

1   223.   The system of claim 89, wherein said member variables are objects when a

2   corresponding database type is a binary file.

1   224.   The system of claim 92, wherein said collection of state objects is implemented using a

2   linked-list.

1   225.   The system of claim 92, wherein said collection of state objects is implemented using a

2   hash-table.

1   226.   The system of claim 84, wherein said stateless business object can include methods for

2   communicating with stored procedures associated with a database view associated with a

3   business object.

1   227.   The system of claim 72, wherein said services allow run-time binding of business

2   objects with XSD schema.

1   228.   The system of claim 227, wherein if said XSD schema changes, then a validation of

2   said business object fails.

1   229.   The system of claim 72, wherein said rapid development services allow business objects

2   to inherit from a set of two or more related objects to form a set of derived related objects such

3   that when one of said derived related objects is changed, then each of object in said set of

4   derived related objects is changed.

1   230.   The system of claim 72, wherein said rapid development services allow business objects

2   to inherit from a set of two or more related objects to form a set of derived related objects such

3   that when one of said derived related objects is deleted, then each object of said set of derived

4   related objects is deleted.

1   231.   The system of claim 100, wherein said rapid development services that allow business

2   objects to convert automatically from one business object to another are overridden.

1   232.   The system of claim 103, wherein said messaging services allow business objects to

2   send email other users.

1   233.   The system of claim 103, wherein said messaging services allow business objects to

2   send messages to other computer systems.

1   234.   The system of claim 103, wherein said messaging services allow business objects to

2   send email to other computer systems.

1   235.   The system of claim 105, wherein said message queue services enable one or more

2   business objects to be invoked at a specific date and time.

1   236.   The system of claim 115, wherein said scheduling services allow business objects to be

2   invoked periodically at specified intervals.

1   237.   The system of claim 123, wherein said naming conventions allow a third-party tool to

2   identify all insert stored procedures that correspond to each table and to each view in said

3   database.

1 238. The system of claim 123, wherein said naming conventions allow a third-party tool to

2 identify all updated stored procedures that correspond to each table and to each view in said

3 database.

1 239. The system of claim 123, wherein said naming conventions allow a third-party tool to

2 identify all deleted stored procedures that correspond to each table and to each view in said

3 database.

1 240. The system of claim 123, wherein said naming conventions allow a third-party tool to

2 identify all query stored procedures that correspond to each table and to each view in said

3 database.

1 241. The system of claim 124, wherein said identification allows a third-party tool to

2 generate automatically all insert stored procedures that correspond to all tables and views of

3 said database.

1 242. The system of claim 124, wherein said identification allows a third-party tool to

2 generate automatically updated stored procedures that correspond to all tables and views of said

3 database.

1 243. The system of claim 124, wherein said identification allows a third-party tool to

2 generate automatically all deleted stored procedures that correspond to all tables and views of

3 said database.

1   244.   The system of claim 1, wherein said client framework provides a set of central services

2   for one or more client forms.

1   245.   The system of claim 1, wherein said client framework provides a set of central services

2   for one or more client dialogs.

1   246.   The system of claim 1, wherein said client framework provides a set of central services

2   for one or more HTML pages.

1   247.   The system of claim 134, wherein said life-cycle services include notifying said client

2   forms and said client dialogs to initialize said client forms and said client dialogs and to

3   notifying said client forms and said client dialogs when a user invokes a command.

1   248.   The system of claim 247, wherein said command is a get command.

1   249.   The system of claim 247, wherein said command is a save command.

1   250.   The system of claim 247, wherein said command is a refresh command.

1   251.   The system of claim 247, wherein said command is a delete command.

1   252.   The system of claim 134, wherein said life-cycle services include notifying one or more

2   of said client forms to initialize one or more of said client forms and to notifying one or more

3   of said client forms when a user invokes a command.

1   253.   The system of claim 252, wherein said command is a get command.

1   254.   The system of claim 252, wherein said command is a save command.

1   255.   The system of claim 252, wherein said command is a refresh command.

1   256.   The system of claim 252, wherein said command is a delete command.

1   257.   The system of claim 134, wherein said life-cycle services include notifying one or more

2   of said client dialogs to initialize one or more of said client dialogs and to notifying one or

3   more of said client dialogs when a user invokes a command.

1   258.   The system of claim 257, wherein said command is a get command.

1   259.   The system of claim 257, wherein said command is a save command.

1   260.   The system of claim 257, wherein said command is a refresh command.

1   261.   The system of claim 257, wherein said command is a delete command.

1   262.   The system of claim 162, wherein said exhibited behavior includes loading one or more

2   controls from specific business object data, taking action on a control selection, taking action

3   when a command is invoked.

1   263.   The system of claim 262, wherein said command is a get command.

1   264.   The system of claim 262, wherein said command is a get command.

1   265.   The system of claim 262, wherein said command is a save command.

1   266.   The system of claim 262, wherein said command is a delete command.

1   267.   The system of claim 262, wherein said command is a refresh command.

1   268.   The system of claim 262, wherein said command is a history command.

1   269.   The system of claim 177, wherein said publish invocation services allow one or more

2   clients within said external framework to subscribe to said events.

1   270.   The system of claim 177, wherein said subscribe invocation services allow one or more

2   clients within said external framework to subscribe to said events.

1   271.   The system of claim 177, wherein said publish invocation services allow one or more

2   client outside of said external framework to subscribe to said events.

1   272.   The system of claim 177, wherein said subscribe invocation services allow one or more

2   client outside of said external framework to subscribe to said events.

1   273.   The system of claim 179, wherein all information in said external framework is in a

2   universal format.

1   274.   A framework for generating objects comprising:

2   a business framework, said business framework constructed and arranged to support one

3   or more services to one or more business objects;

4   a client framework operatively connected to said business framework, said client

5   framework constructed and arranged to support one or more services for one or more client

6   forms;

7   a database framework operatively connected to said business framework, said database

8   framework constructed and arranged to translate functions between said business objects of

9   said business framework and a database; and

10   an external framework operatively connected to said business framework, said external

11   framework constructed and arranged to form one or more templates, said external framework

12   further constructed and arranged to enable the integration with other external vendor software;

13   wherein said business objects of said business framework are created by said client, are

14   stored within said database, and operate with said external vendor software.

1   275.   The framework as in claim 274, wherein said business framework implements a

2   security model.

1   276.   The framework as in claim 274, wherein said business framework implements a

2   plurality of security models.

1 277. A method for generating code comprising:

2 providing one or more data structures to a database framework;

3 providing user interface information to a client framework;

4 providing code instructions to a business framework; and

5 translating business requirements into technical specifications.

1 278. The method of claim 277 further comprising:

2 translating said technical specifications into database technical specifications.

1 279. The method of claim 278 further comprising:

2 creating database schema to match said database technical specifications.

1 280. The method of claim 278 further comprising:

2 changing database schema to match said database technical specifications.

1 281. The method of claim 277 further comprising:

2 translating said technical specifications into business technical specifications.

1 282. The method of claim 281 further comprising:

2 generating one or more business objects to match said business technical specifications.

1 283. The method of claim 282 further comprising:

2 inserting business-logic within said business objects.

1 284. The method of claim 277 further comprising:

2 translating said technical specifications into client technical specifications.

1 285. The method of claim 284 further comprising:

2   generating user interface code from said client technical specifications.

1 286. The method of claim 285 further comprising:

2   inserting client-logic within said interface code.

1 287. The method of claim 277 further comprising:

2   translating technical specifications into external technical specifications.

1 288. The method of claim 287 further comprising:

2   generating a schema from said external technical specifications.

1 289. The method of claim 288 further comprising:

2   inserting external logic into said schema.

1 290. The method of claim 288, wherein said schema is XML schema.

1 291. The system of claim 24, wherein said organizational services allow business objects to

2 belong to groups.

1 292. The system of claim 291, wherein said groups include one or more business groups.

1 293. The system of claim 291, wherein one or more special groups include groups

2 identifying business objects as belonging to said client framework.

1 294. The system of claim 1, said system further comprising:

2 an external framework operative with said business framework.

1 295. A system having a processor, memory operative with said processor, and storage media

2 operative with said processor, said system further comprising:

3 a business framework;

4 a database framework operative with said business framework;

5 a client framework operative with said business framework; and

6 an external framework operative with said business framework;

7 wherein said business framework, said database framework, said client framework, and

8 said external framework form an enterprise system framework.